T00290 "95h98860

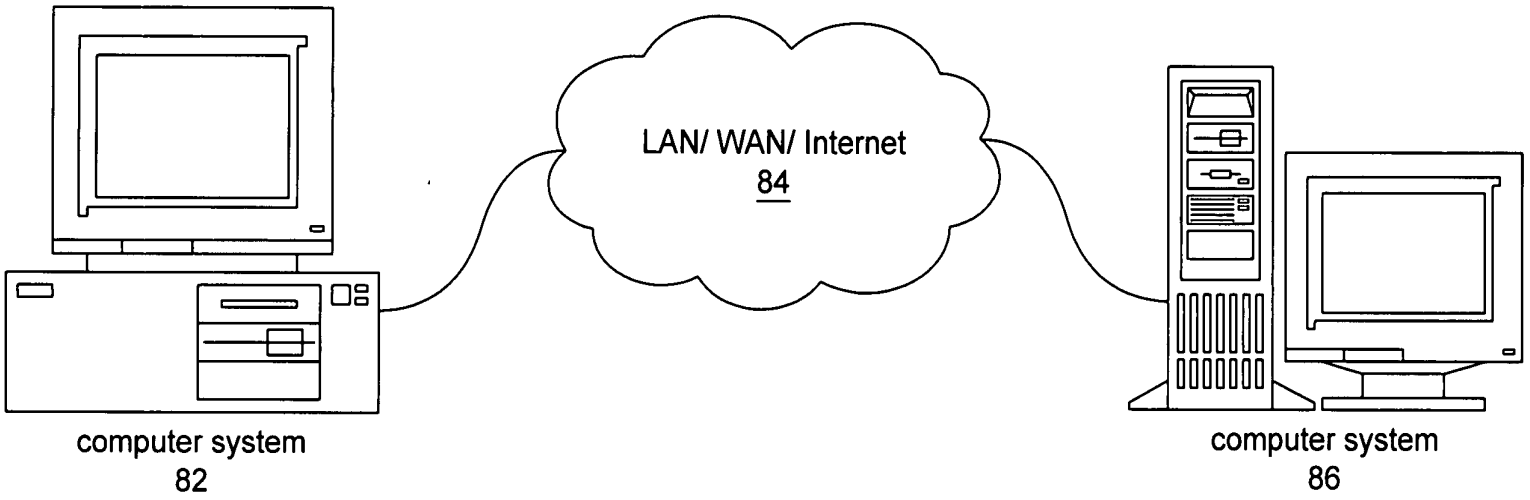

FIG.1

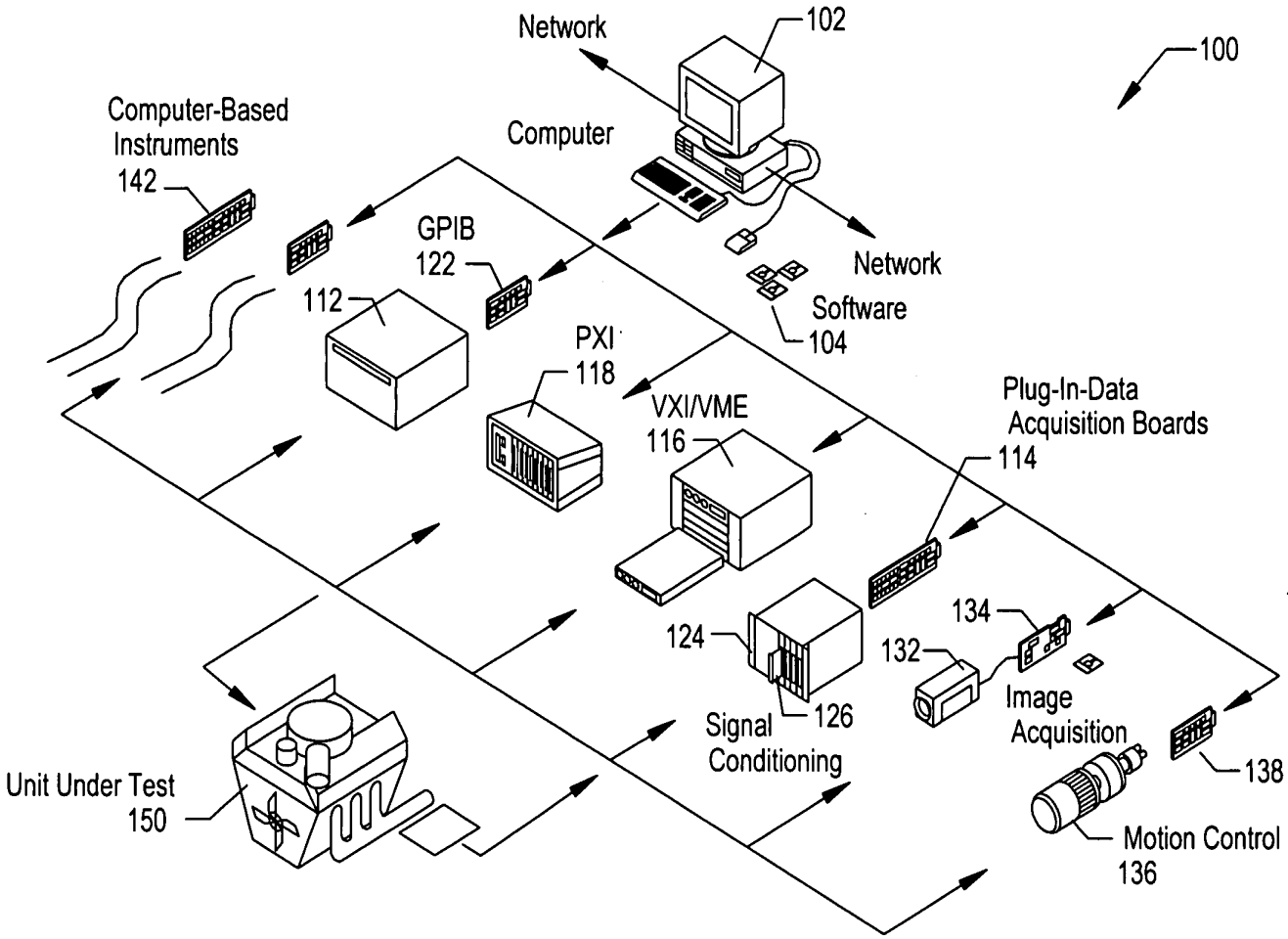
Network
102
100
Computer-Based
Instruments
142
Computer
GPIB
122
112
Network
Software
104
PXI
118
VXI/VME
116
Plug-In-Data
Acquisition Boards
114
124
134
132
Image
Acquisition
Signal
Conditioning
126
138
Unit Under Test
150
Motion Control
136

FIG. 2A

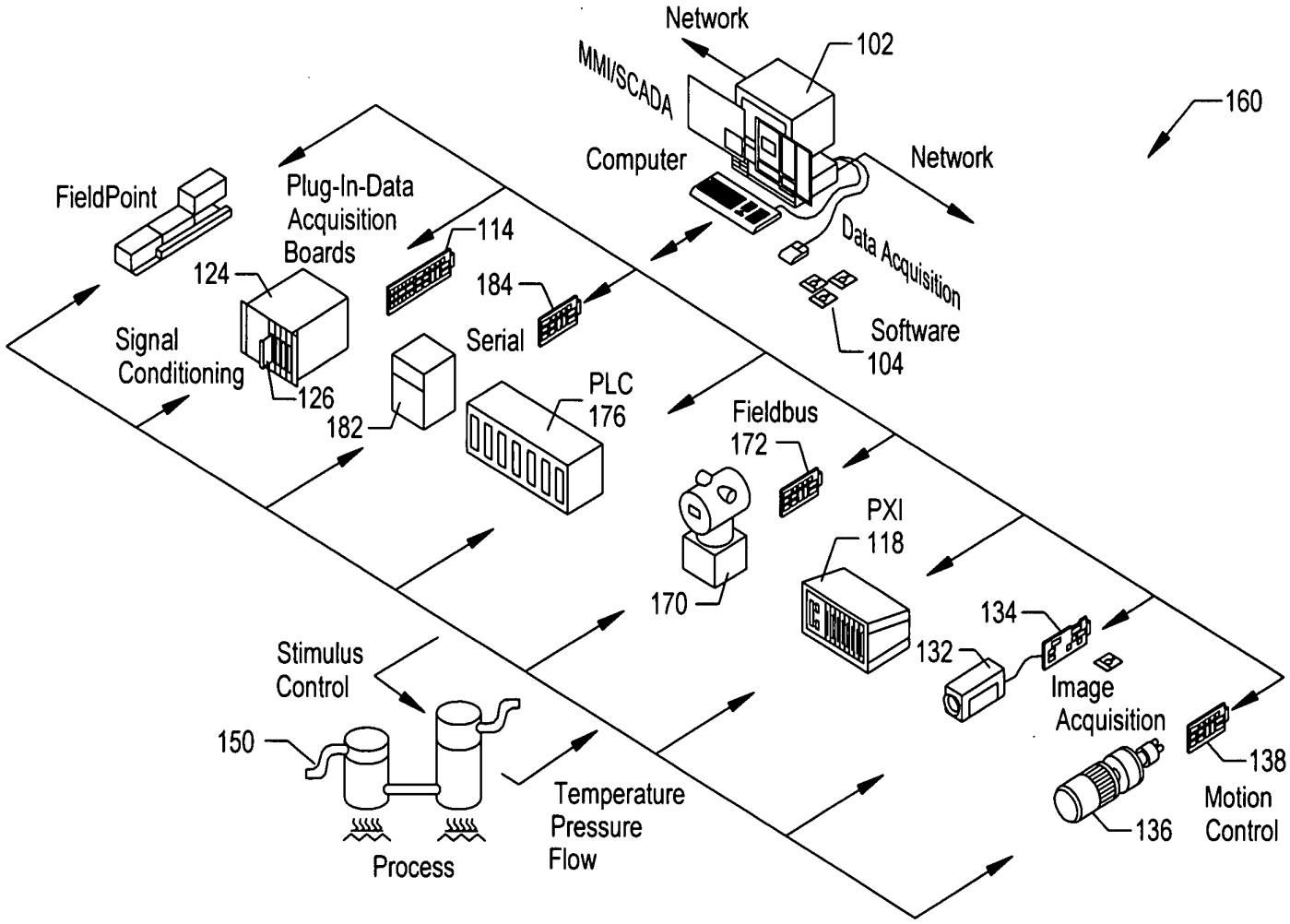
Network
102
MMI/SCADA
Computer
Network
160
Data Acquisition
Software
104
FieldPoint
Plug-In-Data
Acquisition
Boards
114
124
184
Serial
Signal
Conditioning
126
182
PLC
176
Fieldbus
172
PXI
118
170
134
132
Image
Acquisition
138
Motion
Control
136
Stimulus
Control
150
Temperature
Pressure
Flow
Process

FIG. 2B

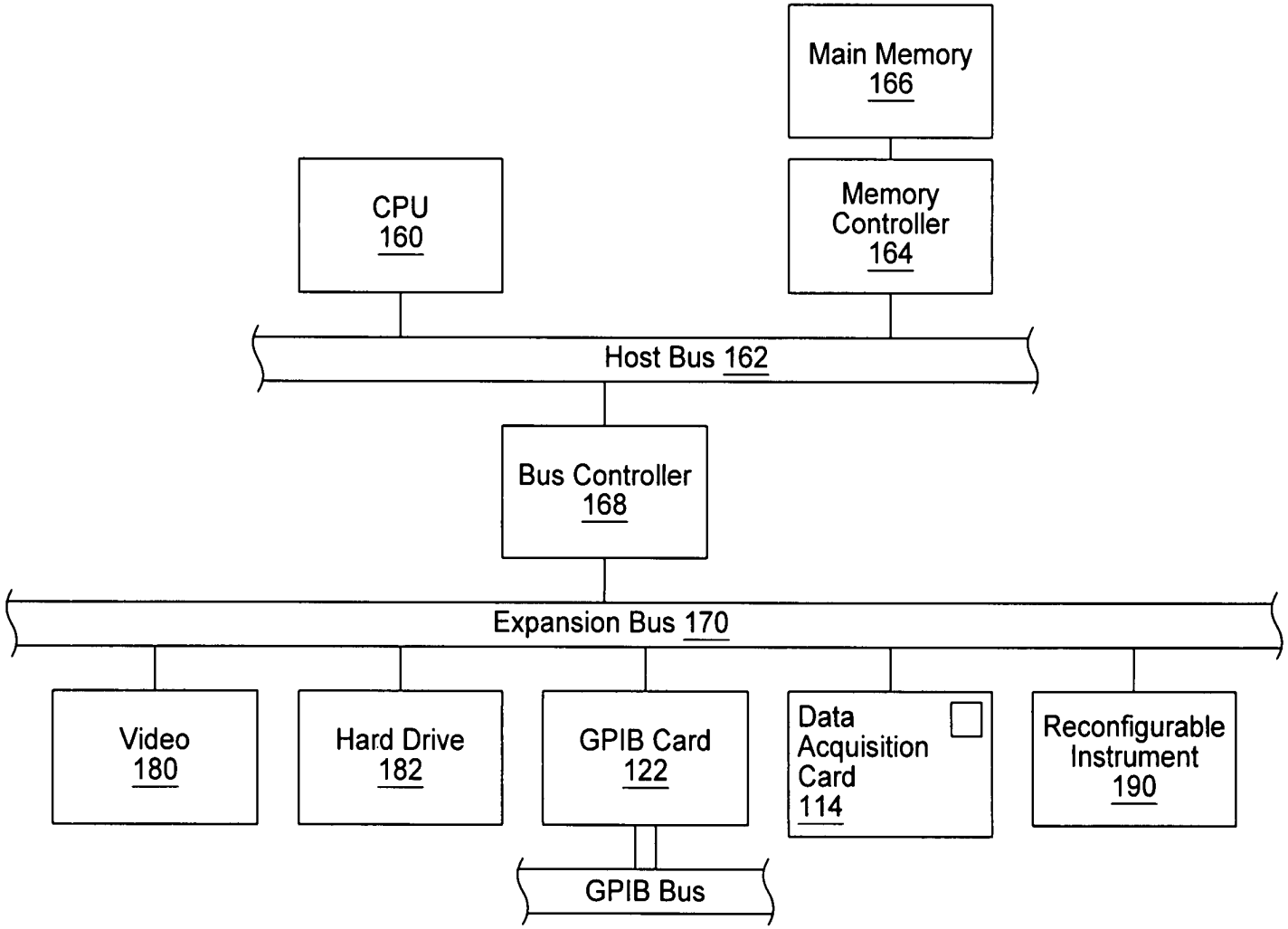
Main Memory
166
CPU
160
Memory
Controller
164
Host Bus 162
Bus Controller
168
Expansion Bus 170
Video
180
Hard Drive
182
GPIB Card
122
Data
Acquisition
Card
114
Reconfigurable
Instrument
190
GPIB Bus

FIG. 3

U.S. Patent No. 7,000,224

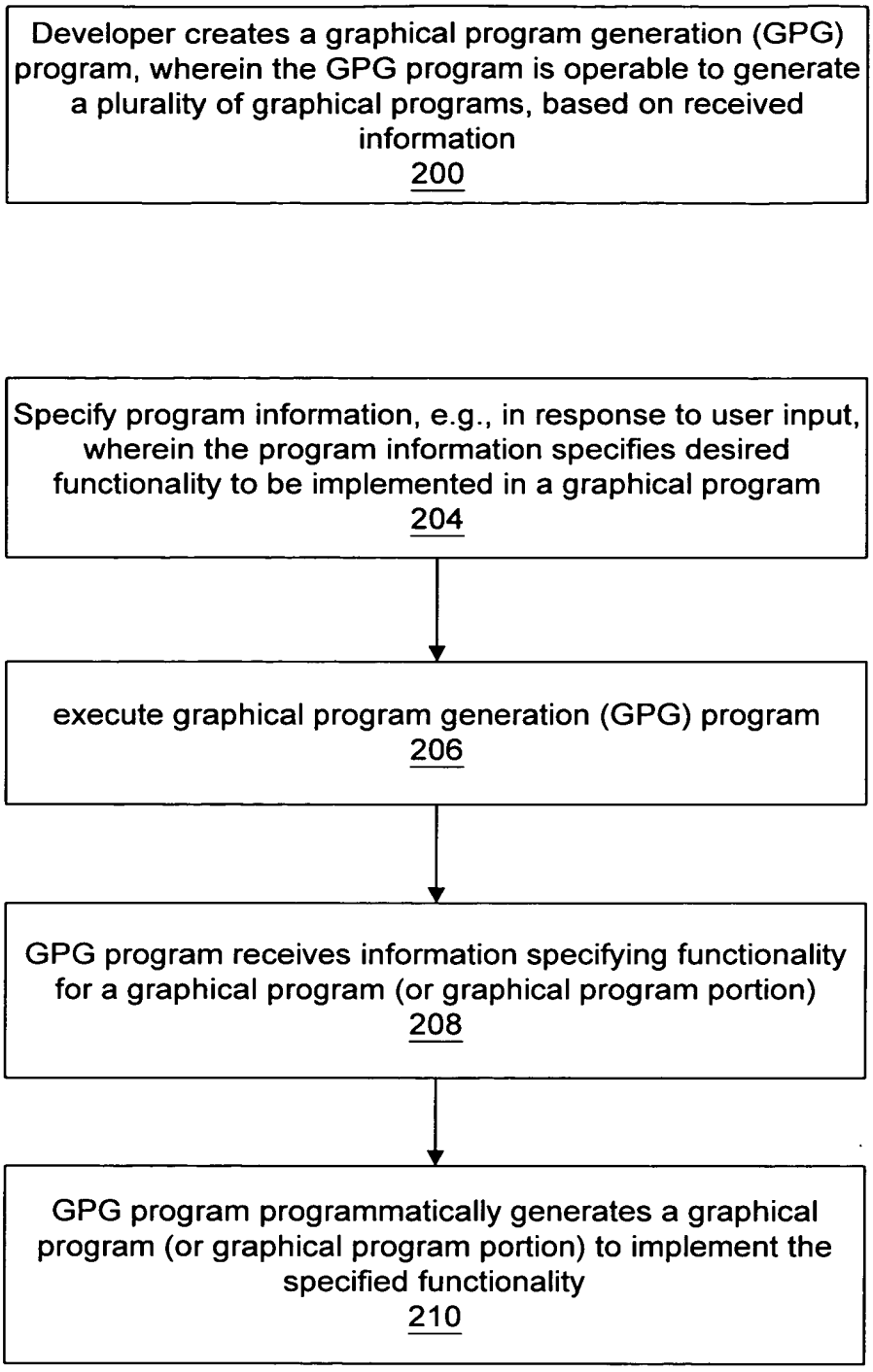

FIG. 4

T00290 "SSH98860

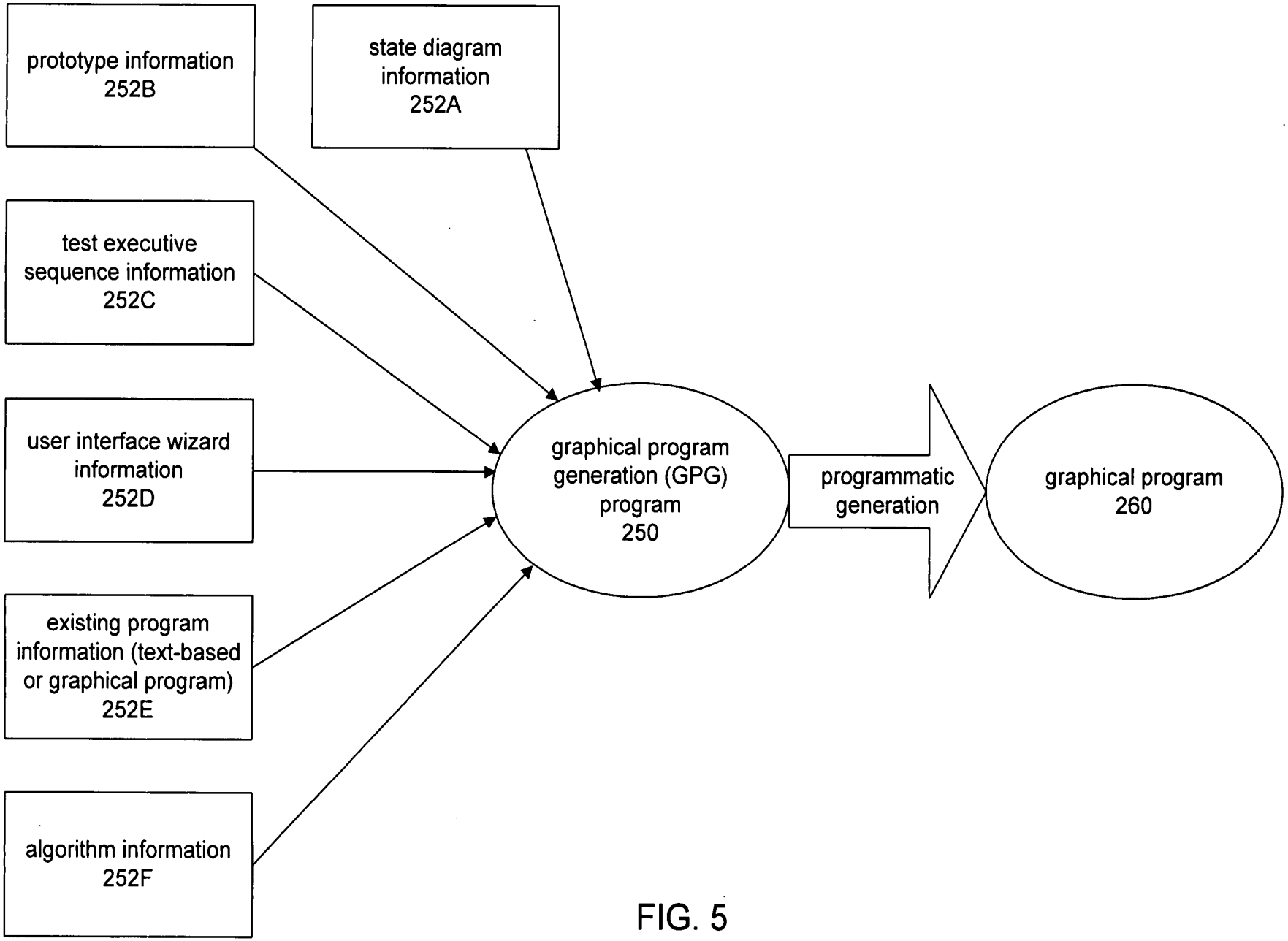

FIG. 5

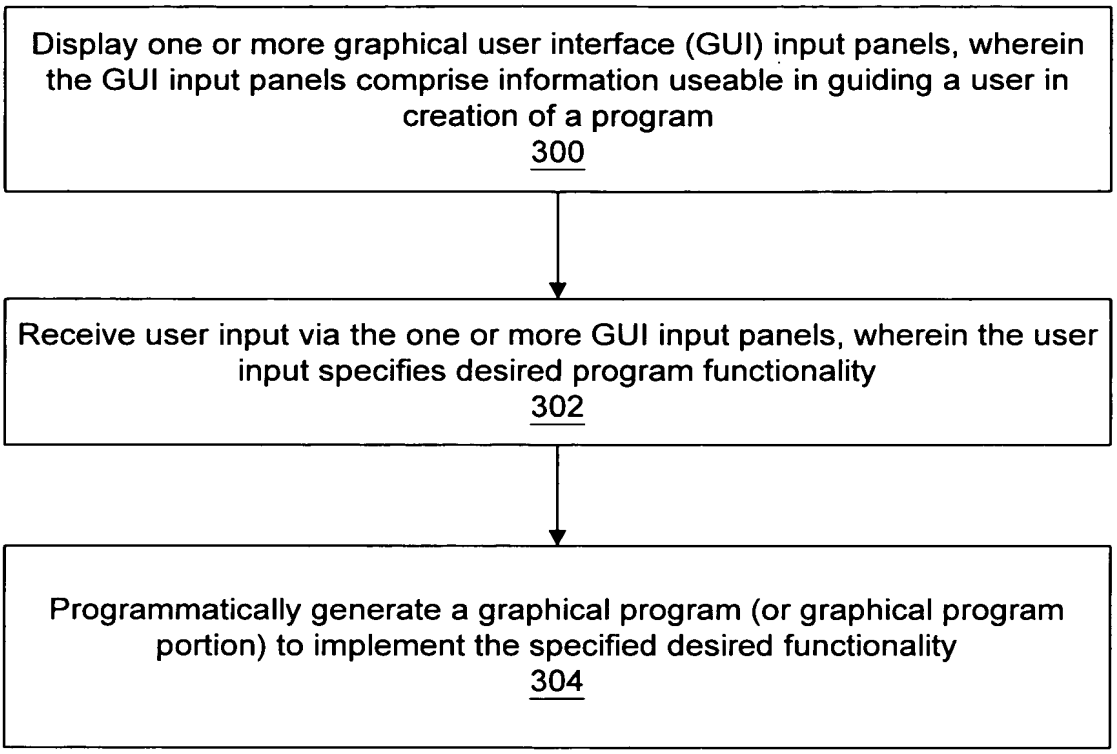
Display one or more graphical user interface (GUI) input panels, wherein the GUI input panels comprise information useable in guiding a user in creation of a program
300
Receive user input via the one or more GUI input panels, wherein the user input specifies desired program functionality
302
Programmatically generate a graphical program (or graphical program portion) to implement the specified desired functionality
304

FIG. 6

U.S. Patent No. 7,086,009

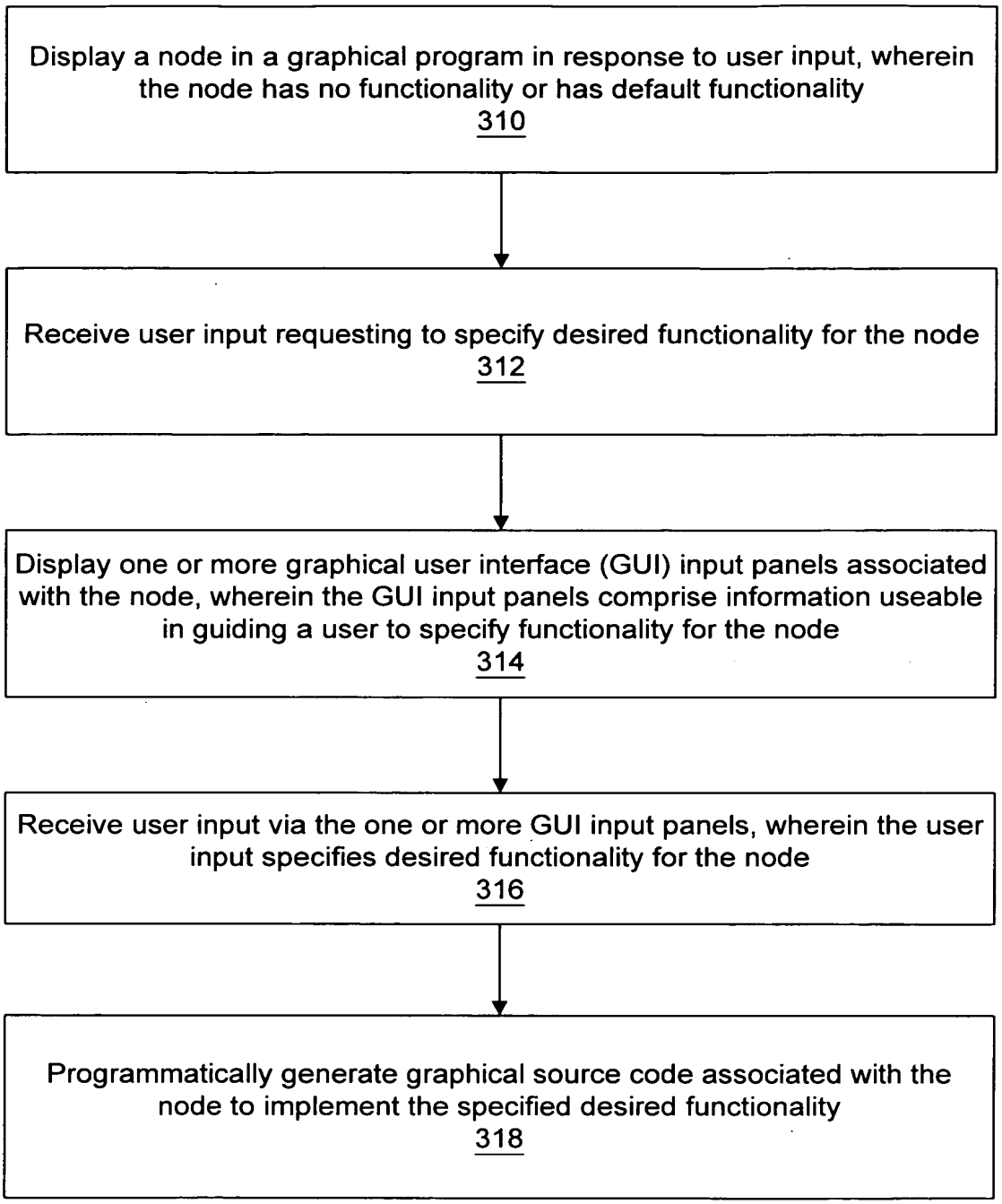

FIG. 7

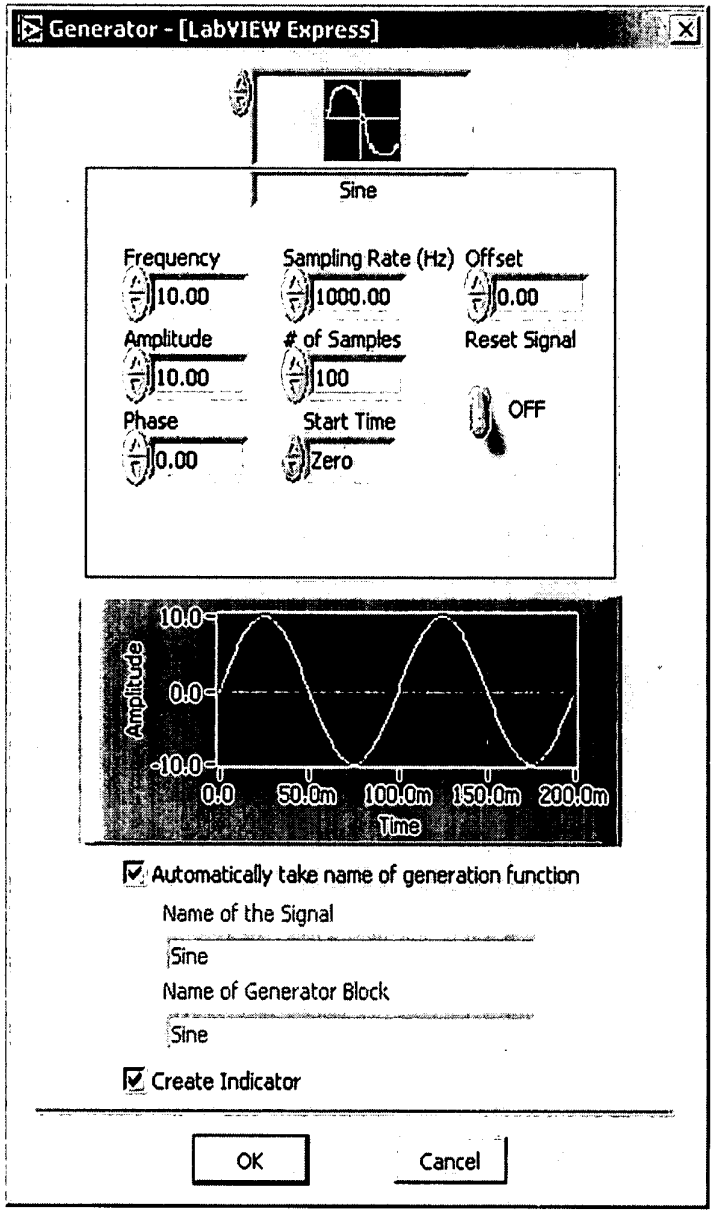
Generator - [LabVIEW Express]
Sine
Frequency
10.00
Sampling Rate (Hz)
1000.00
Offset
0.00
Amplitude
10.00
# of Samples
100
Reset Signal
OFF
Phase
0.00
Start Time
Zero
10.0
0.0
-10.0
Amplitude
0.0
50.0m
100.0m
150.0m
200.0m
Time
Automatically take name of generation function
Name of the Signal
Sine
Name of Generator Block
Sine
Create Indicator
OK
Cancel

FIG. 8

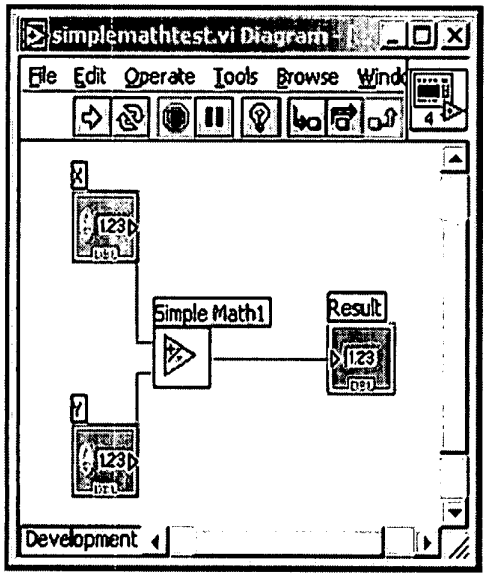

FIG. 9

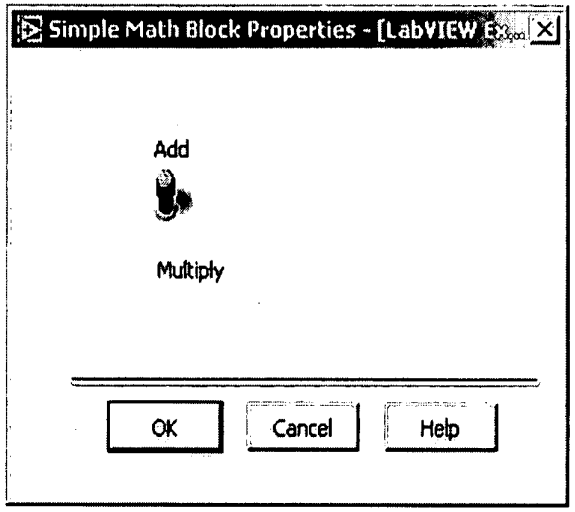

FIG. 10

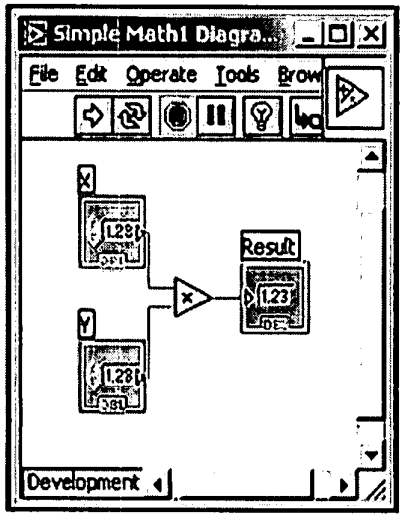

FIG. 11

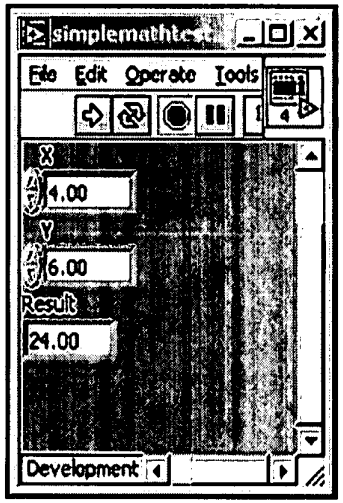

FIG. 12

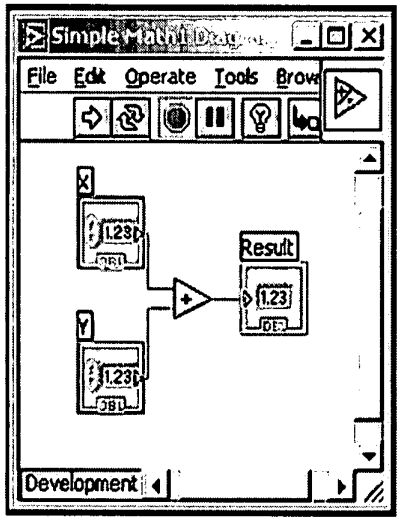
File Edit Operate Tools Brow
X
1.23
Result
1.23
Y
1.23
Development

FIG. 13

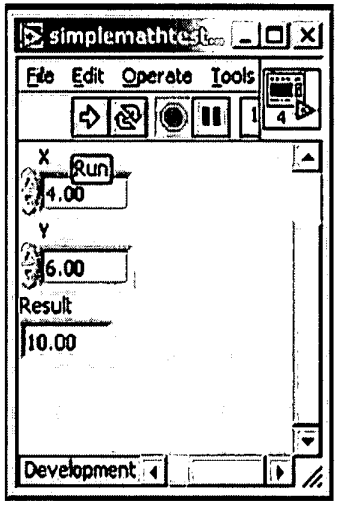
File Edit Operate Tools
X
Run
4.00
Y
6.00
Result
10.00
Development

FIG. 14

08805455.060204

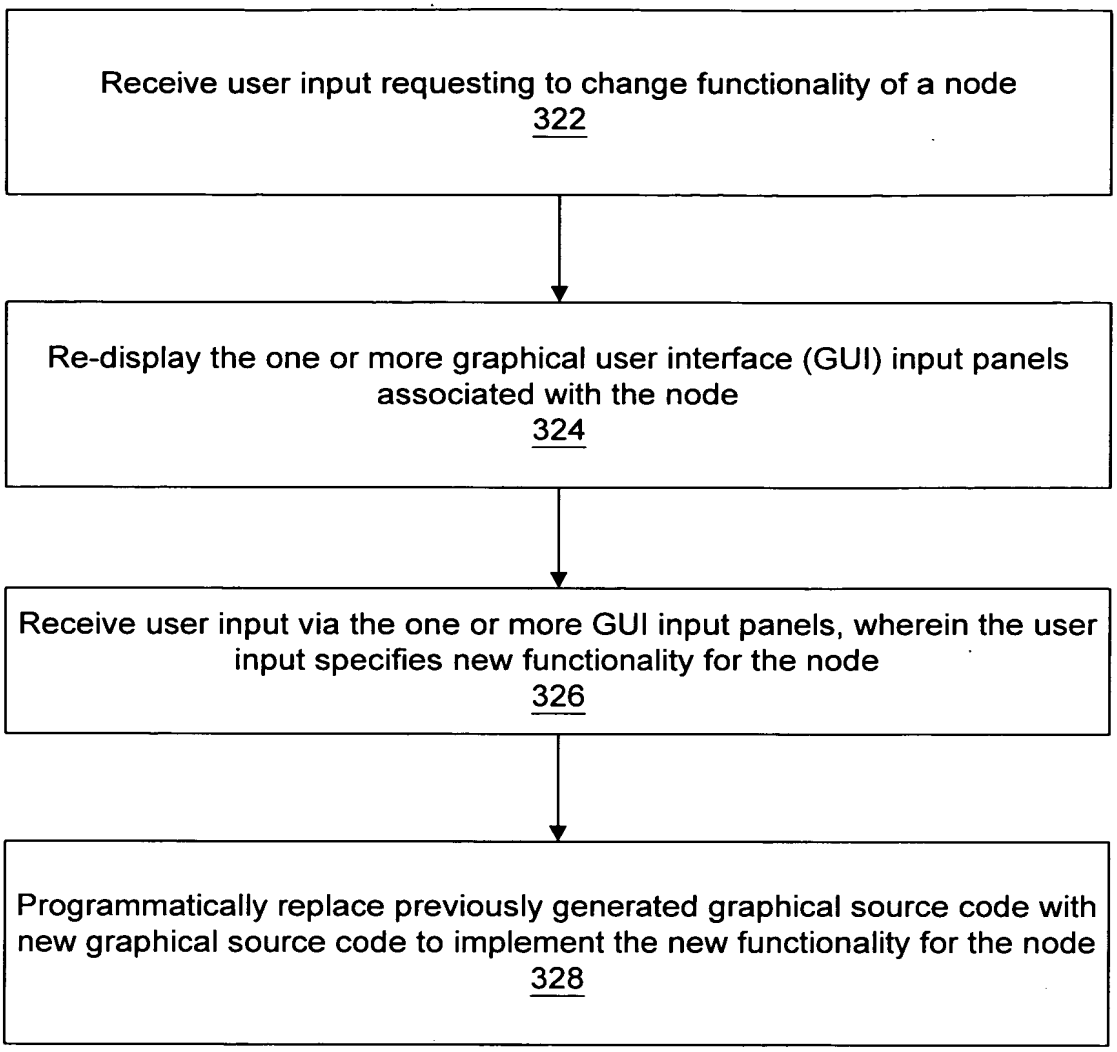

FIG. 15

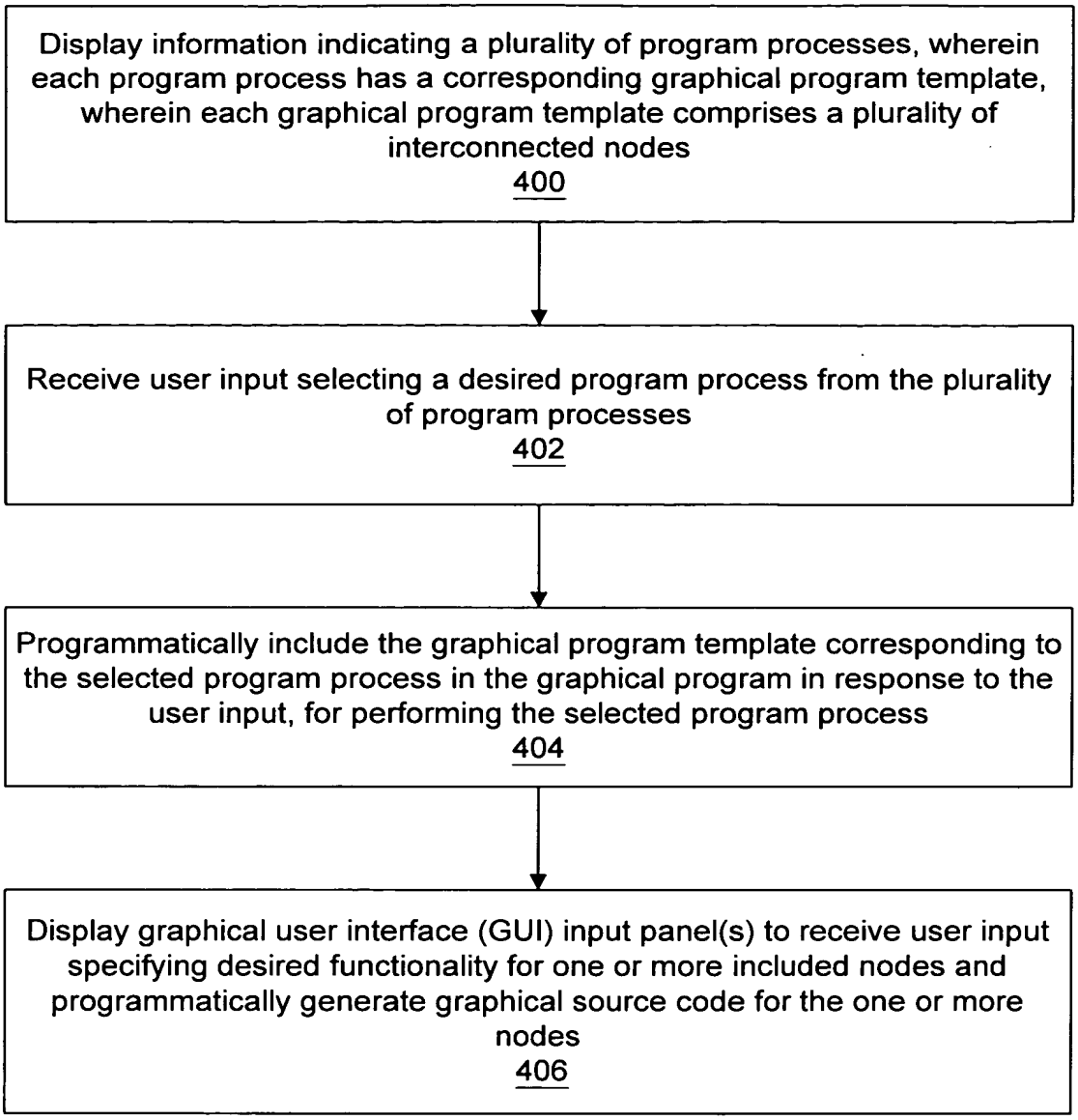
Display information indicating a plurality of program processes, wherein each program process has a corresponding graphical program template, wherein each graphical program template comprises a plurality of interconnected nodes
400
Receive user input selecting a desired program process from the plurality of program processes
402
Programmatically include the graphical program template corresponding to the selected program process in the graphical program in response to the user input, for performing the selected program process
404
Display graphical user interface (GUI) input panel(s) to receive user input specifying desired functionality for one or more included nodes and programmatically generate graphical source code for the one or more nodes
406

FIG. 16

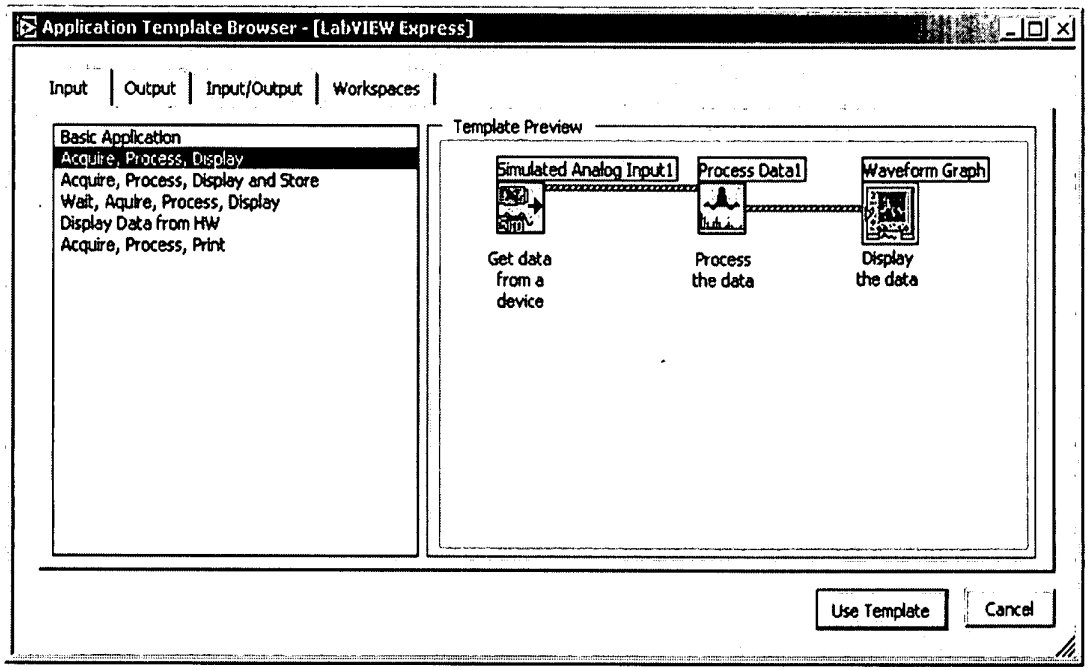
Application Template Browser - [LabVIEW Express]
Input
Output
Input/Output
Workspaces
Basic Application
Acquire, Process, Display
Acquire, Process, Display and Store
Wait, Aquire, Process, Display
Display Data from HW
Acquire, Process, Print
Template Preview
Simulated Analog Input1
Process Data1
Waveform Graph
Get data from a device
Process the data
Display the data
Use Template
Cancel

FIG. 17

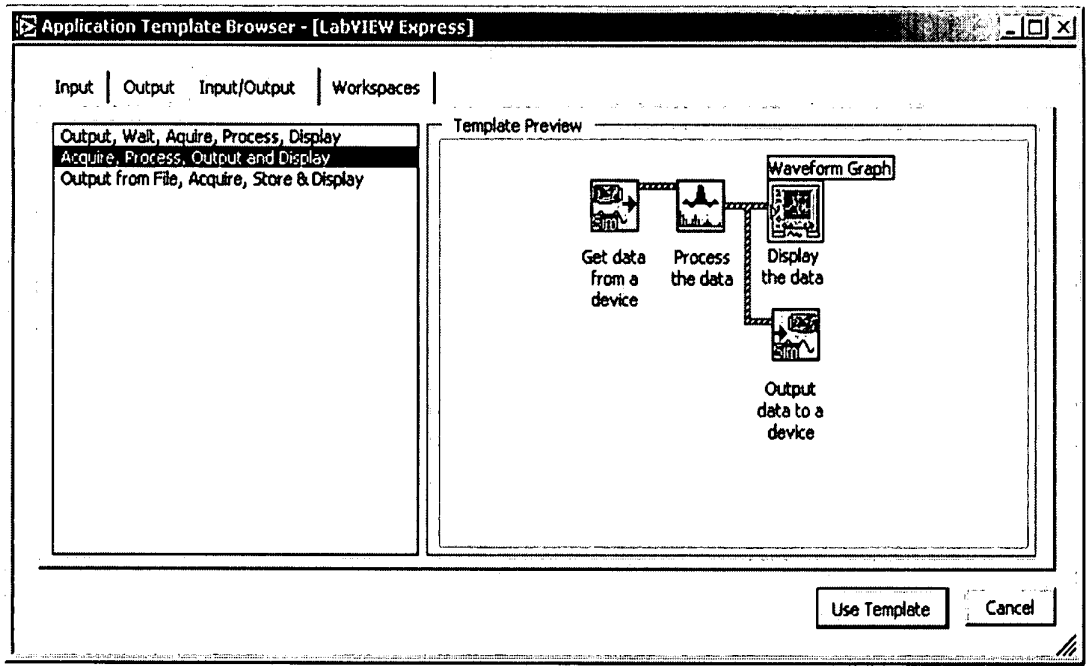
Application Template Browser - [LabVIEW Express]
Input
Output
Input/Output
Workspaces
Output, Wait, Acquire, Process, Display
Acquire, Process, Output and Display
Output from File, Acquire, Store & Display
Template Preview
Waveform Graph
Get data from a device
Process the data
Display the data
Output data to a device
Use Template
Cancel

FIG. 18

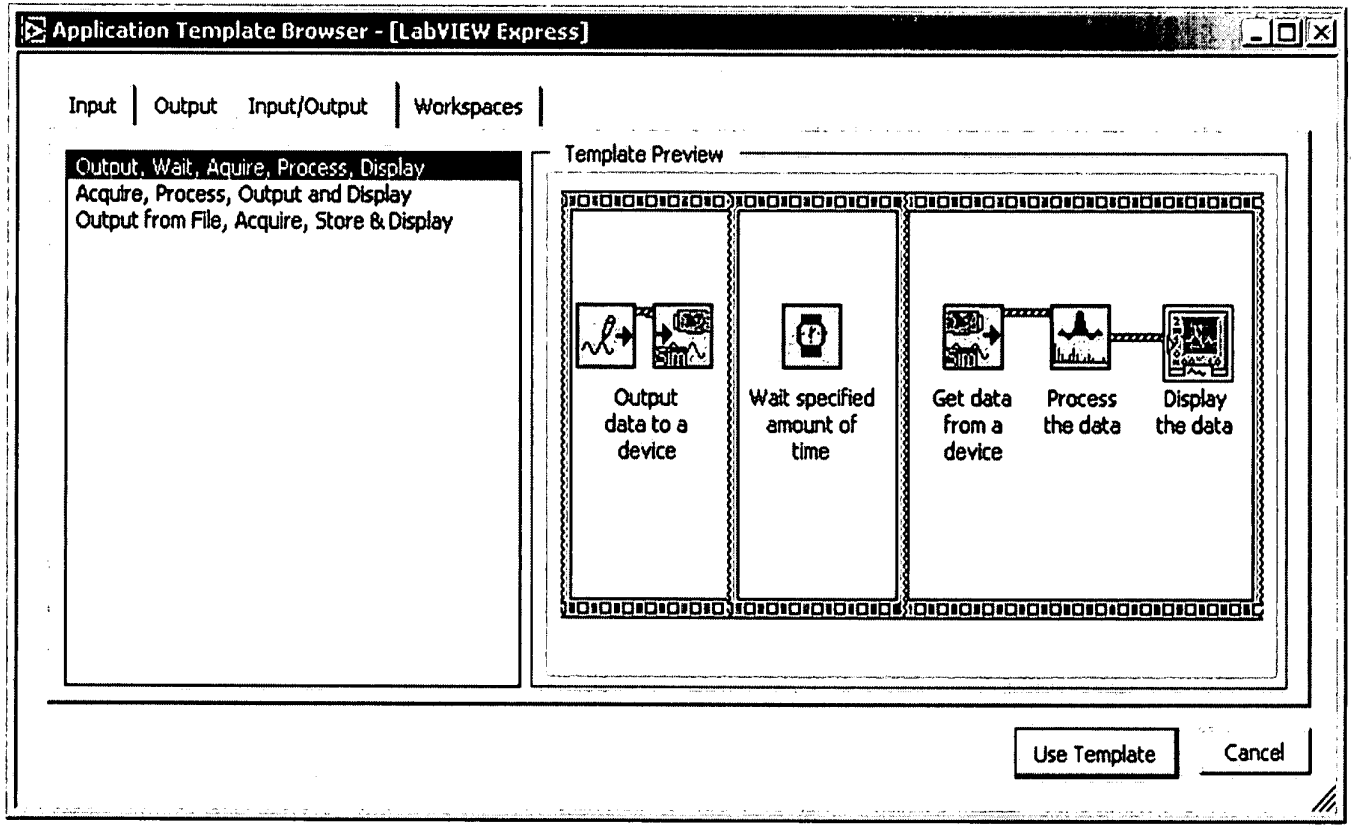
Application Template Browser - [LabVIEW Express]
Input
Output
Input/Output
Workspaces
Output, Wait, Aquire, Process, Display
Acquire, Process, Output and Display
Output from File, Acquire, Store & Display
Template Preview
Output data to a device
Wait specified amount of time
Get data from a device
Process the data
Display the data
Use Template
Cancel

FIG. 19

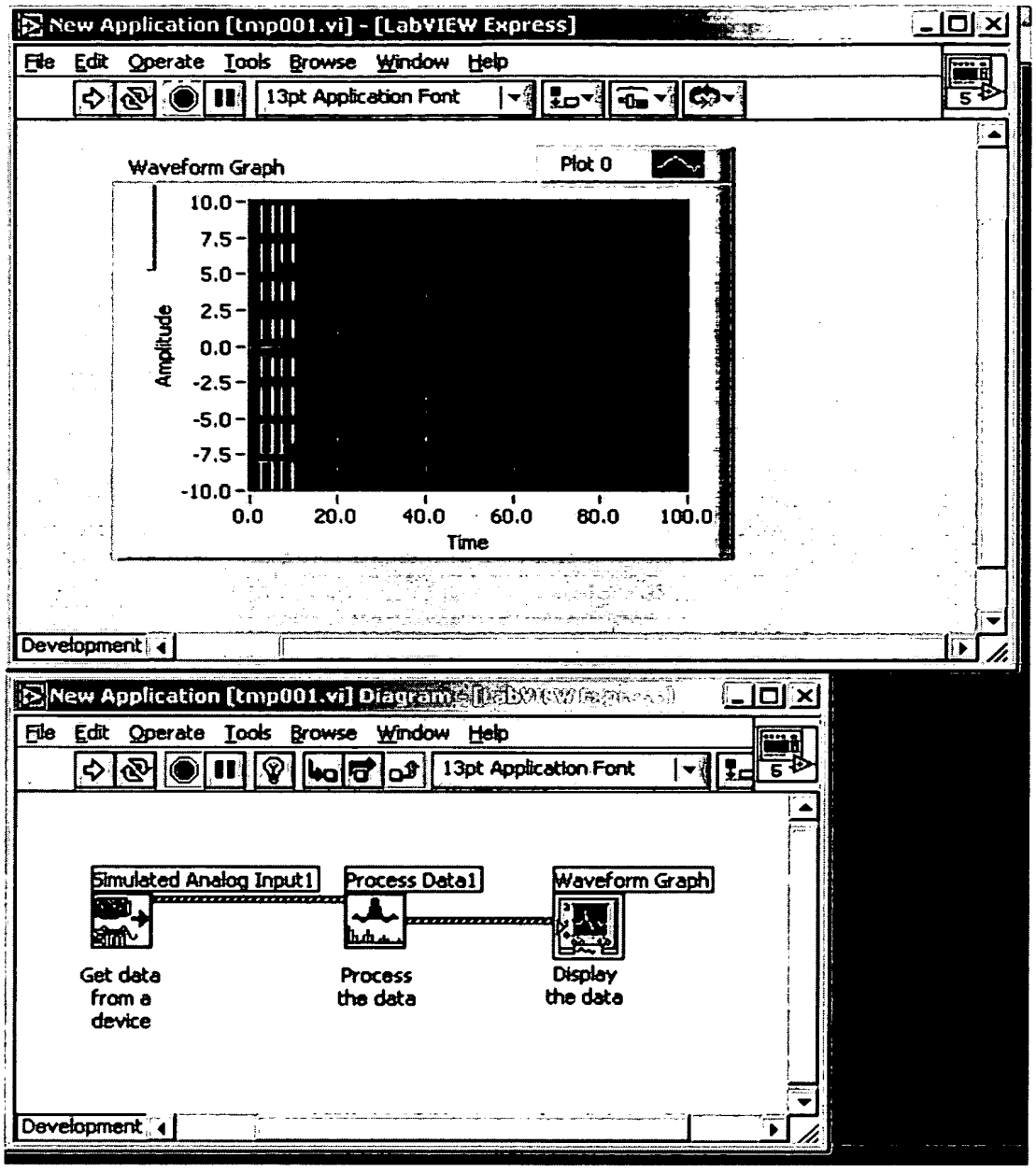
New Application [tmp001.vi] - [LabVIEW Express]
File Edit Operate Tools Browse Window Help
13pt Application Font
Waveform Graph
Plot 0
10.0
7.5
5.0
2.5
0.0
-2.5
-5.0
-7.5
-10.0
Amplitude
0.0
20.0
40.0
60.0
80.0
100.0
Time
Development
New Application [tmp001.vi] Diagram
File Edit Operate Tools Browse Window Help
13pt Application Font
Simulated Analog Input1
Process Data1
Waveform Graph
Get data from a device
Process the data
Display the data
Development

FIG. 20

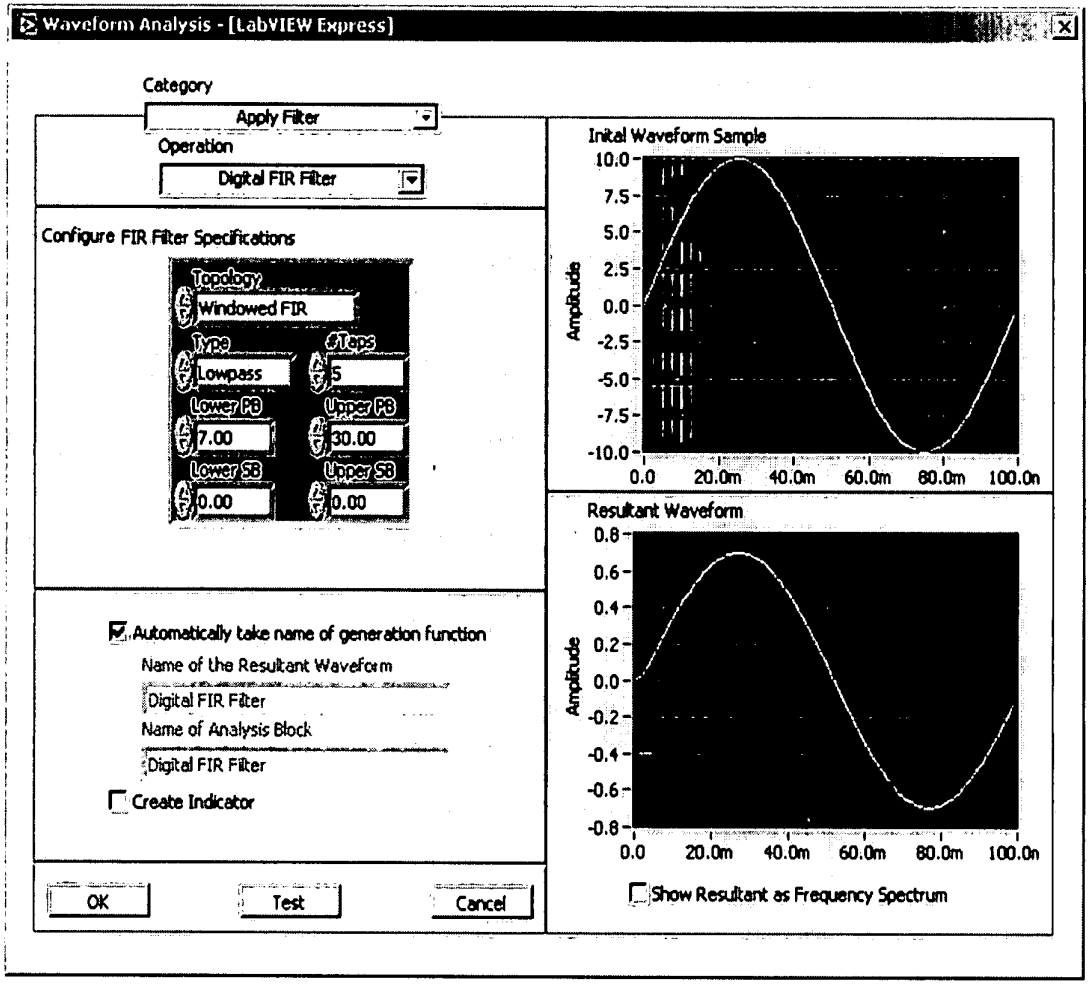
Waveform Analysis - [LabVIEW Express]
Category
Apply Filter
Operation
Digital FIR Filter
Configure FIR Filter Specifications
Topology
Windowed FIR
Type
Lowpass
#Taps
5
Lower PB
7.00
Upper PB
30.00
Lower SB
0.00
Upper SB
0.00
Automatically take name of generation function
Name of the Resultant Waveform
Digital FIR Filter
Name of Analysis Block
Digital FIR Filter
Create Indicator
OK
Test
Cancel
Inital Waveform Sample
Amplitude
10.0
7.5
5.0
2.5
0.0
-2.5
-5.0
-7.5
-10.0
0.0
20.0m
40.0m
60.0m
80.0m
100.0m
Resultant Waveform
Amplitude
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
0.0
20.0m
40.0m
60.0m
80.0m
100.0m
Show Resultant as Frequency Spectrum

FIG. 21

Doc. No. 5005-005US

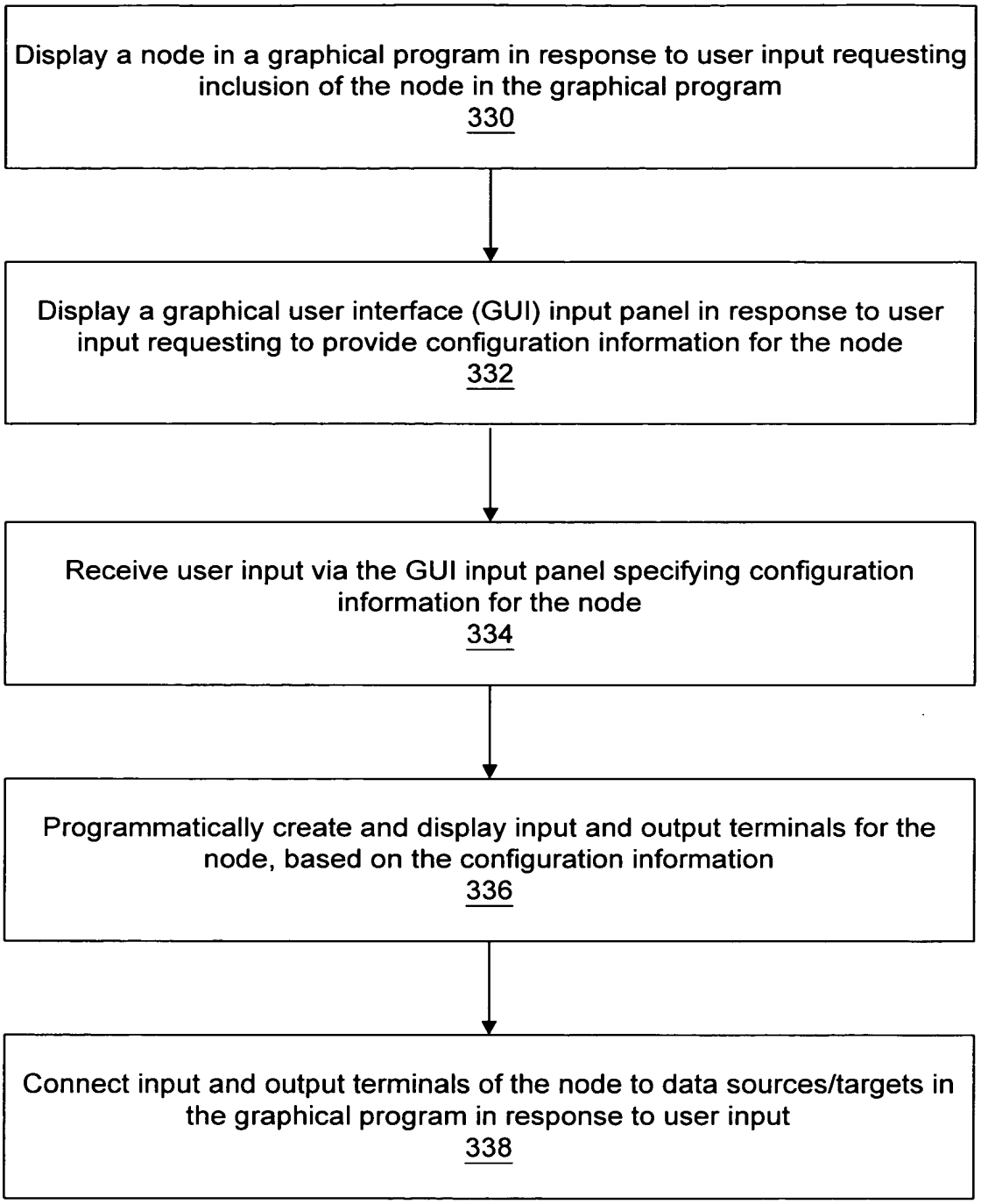

FIG. 22

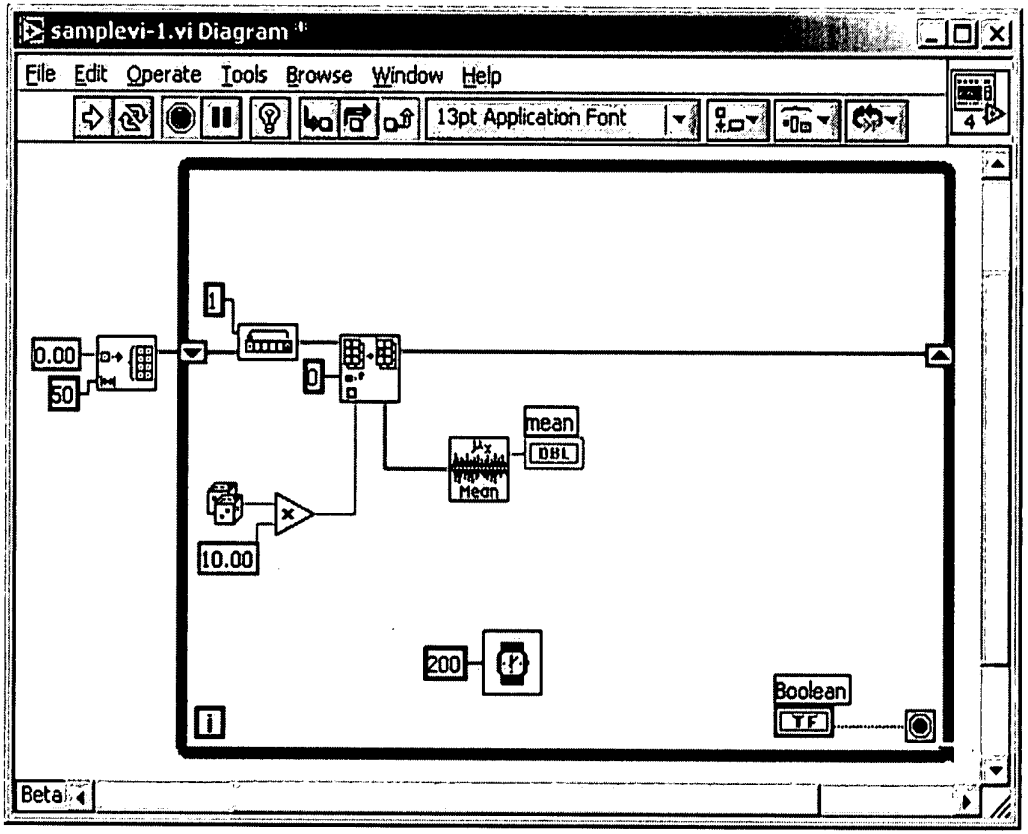

FIG. 23
(PRIOR ART)

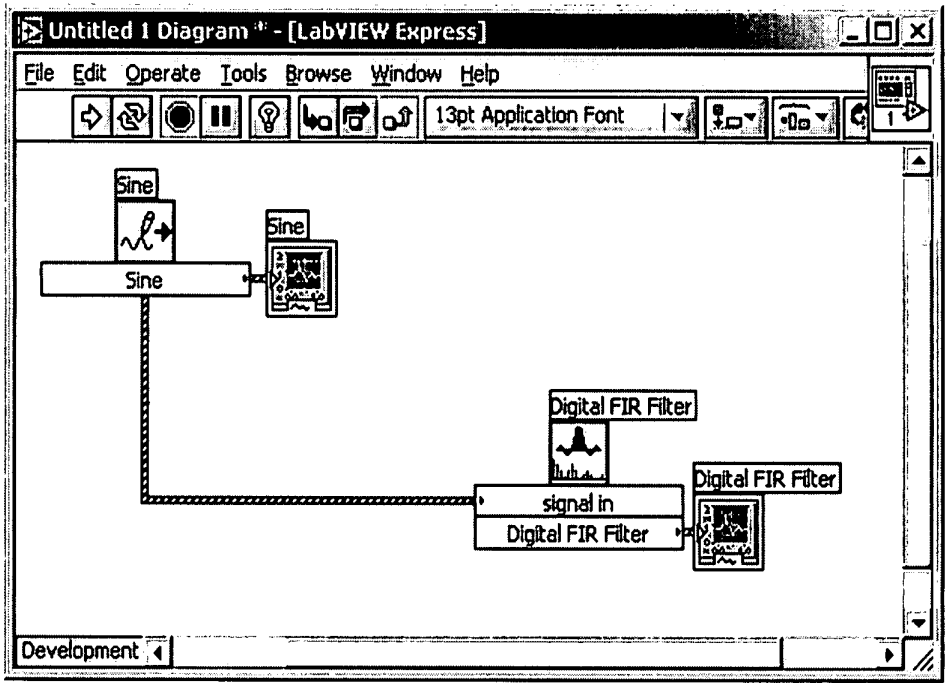
Untitled 1 Diagram * - [LabVIEW Express]
File Edit Operate Tools Browse Window Help
13pt Application Font
Sine
Sine
Sine
Digital FIR Filter
Digital FIR Filter
signal in
Digital FIR Filter
Development

FIG. 24

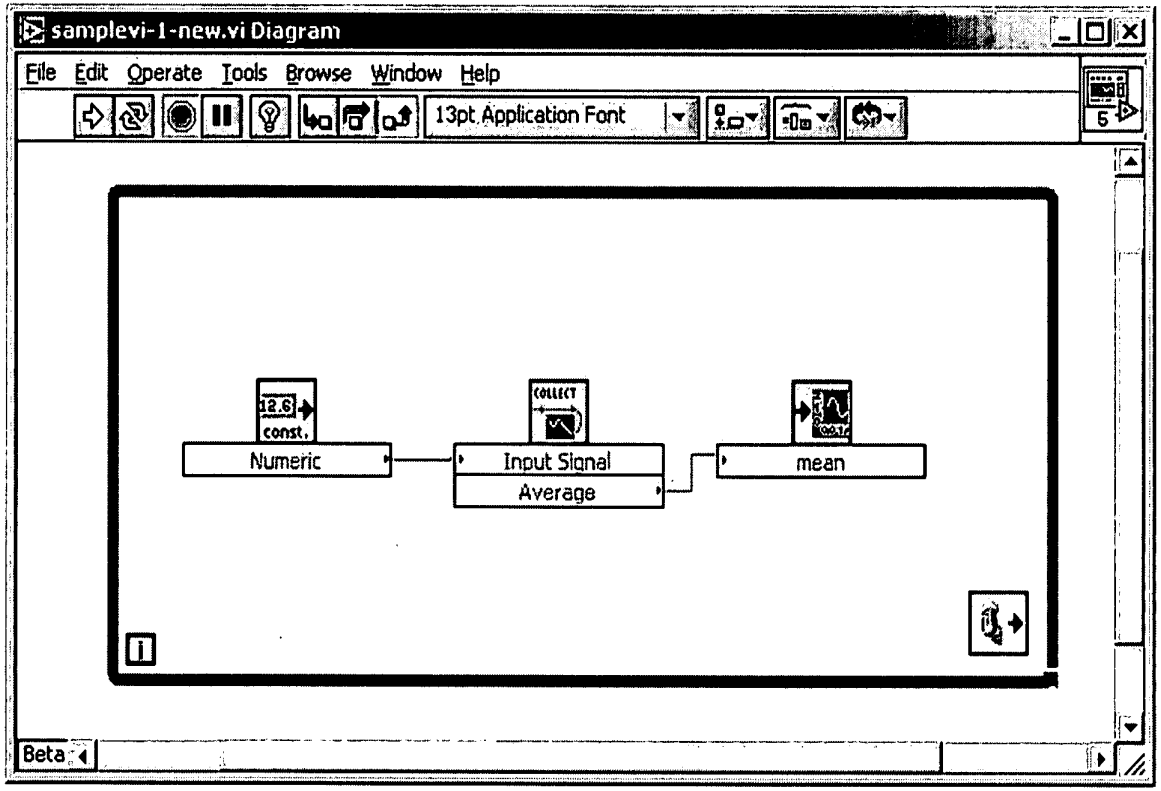
samplevi-1-new.vi Diagram
File Edit Operate Tools Browse Window Help
13pt Application Font
12.6
const.
Numeric
COLLECT
Input Signal
Average
mean
i
Beta

FIG. 25

06660.5055.00000

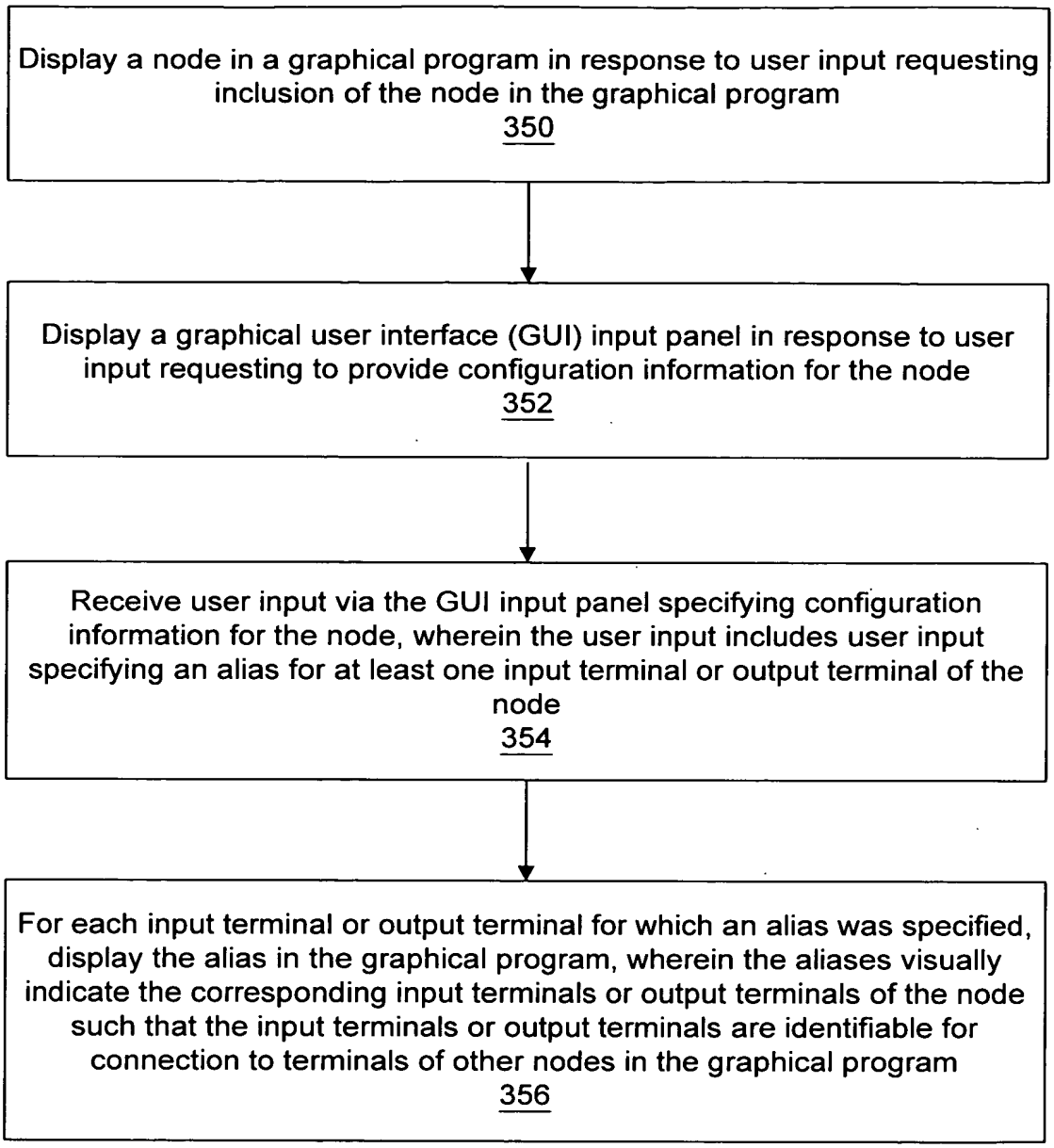

FIG. 26

US 8,055,450 B2

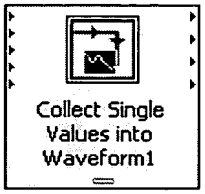

FIG. 27

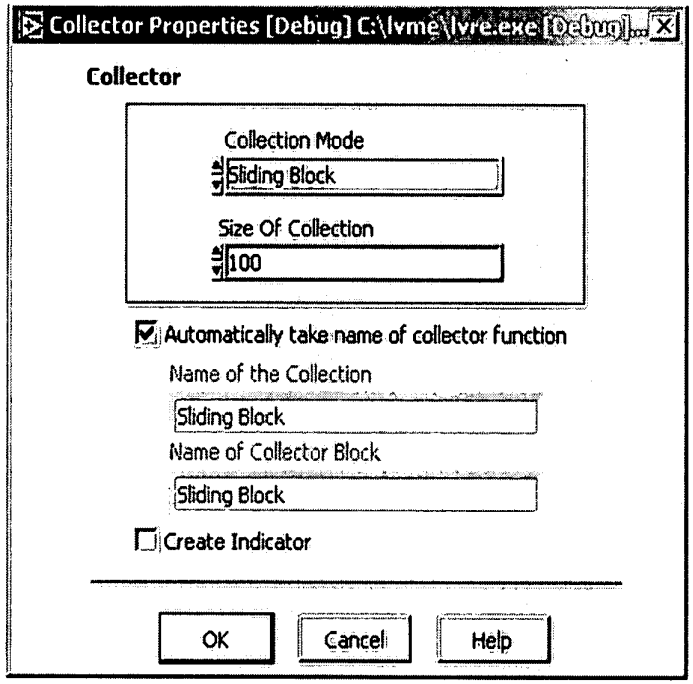
Collector Properties [Debug] C:\lvme\lvre.exe [Debug]...
Collector
Collection Mode
Sliding Block
Size Of Collection
100
Automatically take name of collector function
Name of the Collection
Sliding Block
Name of Collector Block
Sliding Block
Create Indicator
OK
Cancel
Help

FIG. 28

6,868,450 - 03/15/05

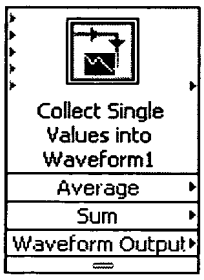

FIG. 29

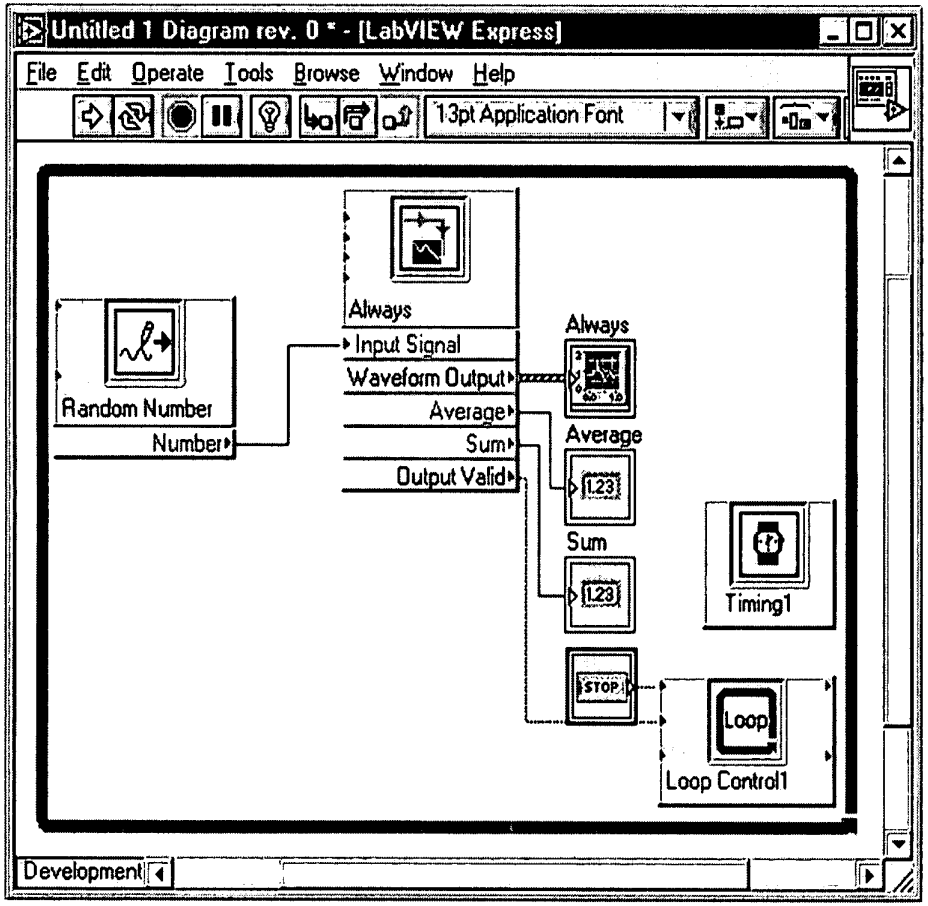
Untitled 1 Diagram rev. 0 * - [LabVIEW Express]
File Edit Operate Tools Browse Window Help
13pt Application Font
Always
Input Signal
Waveform Output
Average
Sum
Output Valid
Random Number
Number
Always
Average
123
Sum
123
Timing1
STOP
Loop
Loop Control1
Development

FIG. 30

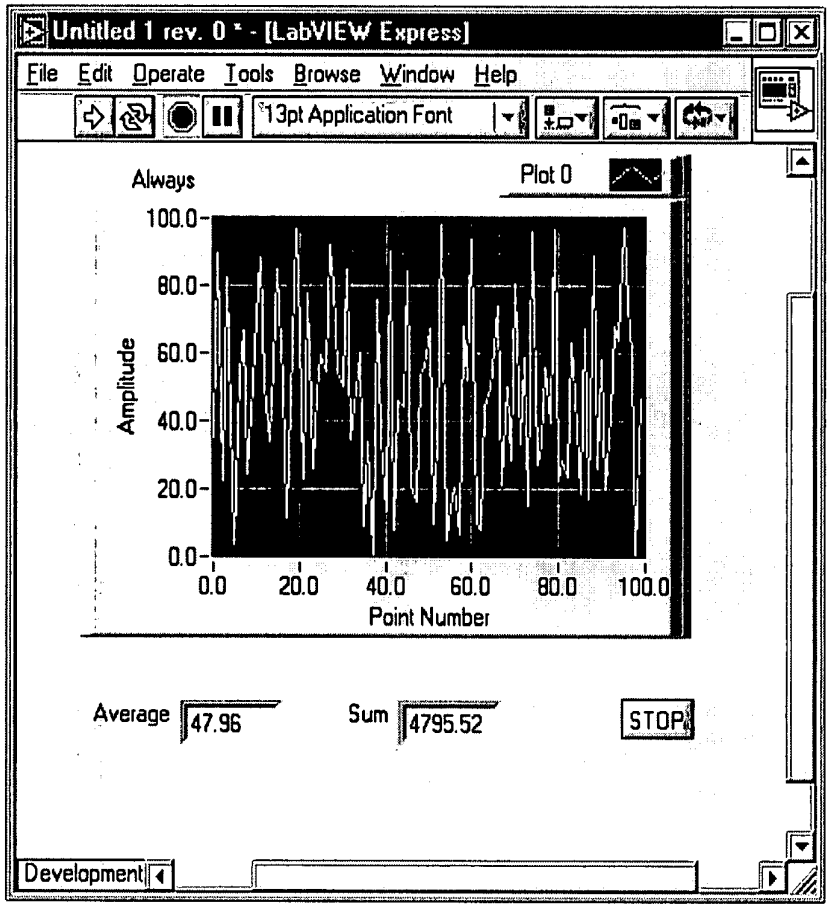
Untitled 1 rev. 0 * - [LabVIEW Express]
File Edit Operate Tools Browse Window Help
13pt Application Font
Always
Plot 0
100.0
80.0
60.0
40.0
20.0
0.0
Amplitude
0.0 20.0 40.0 60.0 80.0 100.0
Point Number
Average 47.96
Sum 4795.52
STOP
Development

FIG. 31

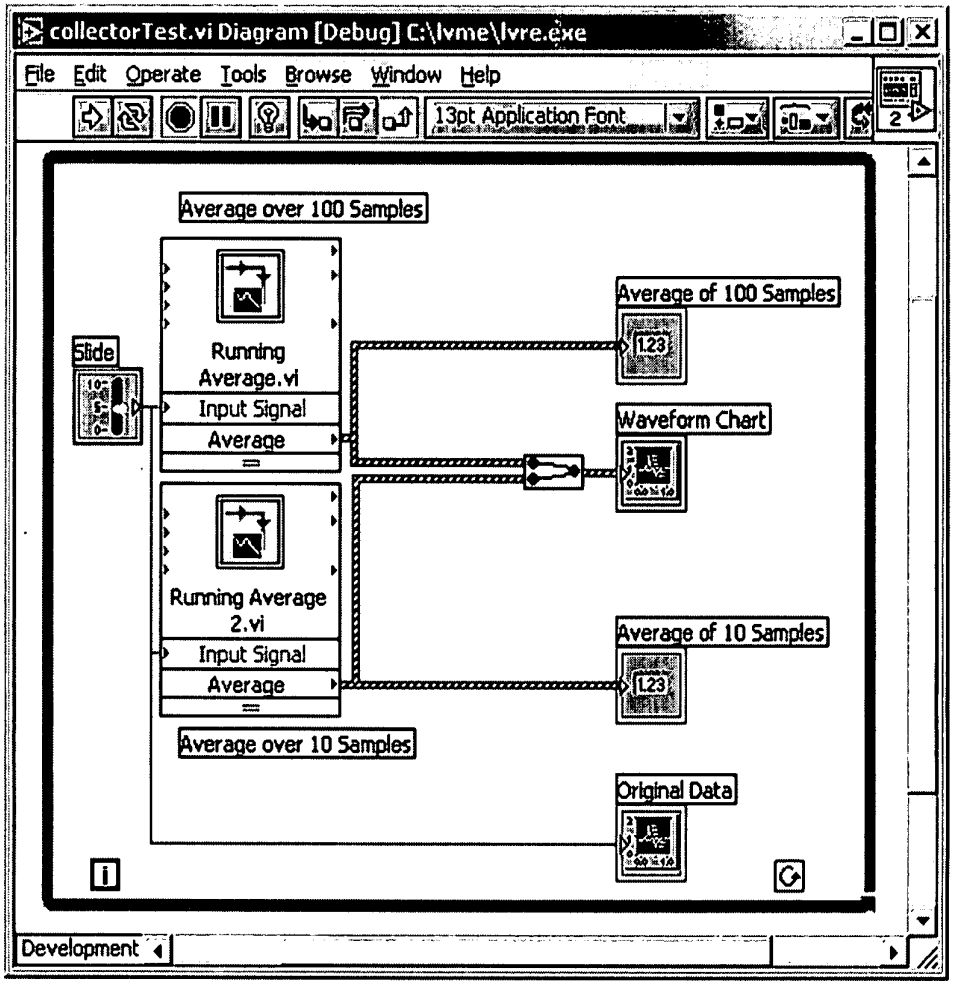
collectorTest.vi Diagram [Debug] C:\lvme\lvre.exe
File Edit Operate Tools Browse Window Help
13pt Application Font
Average over 100 Samples
Slide
Running Average.vi
Input Signal
Average
Average of 100 Samples
Waveform Chart
Running Average 2.vi
Input Signal
Average
Average of 10 Samples
Average over 10 Samples
Original Data
Development

FIG. 32

Patent Application Publication Sep. 25, 2003 Sheet 33 of 34 US 2003/0182454 A1

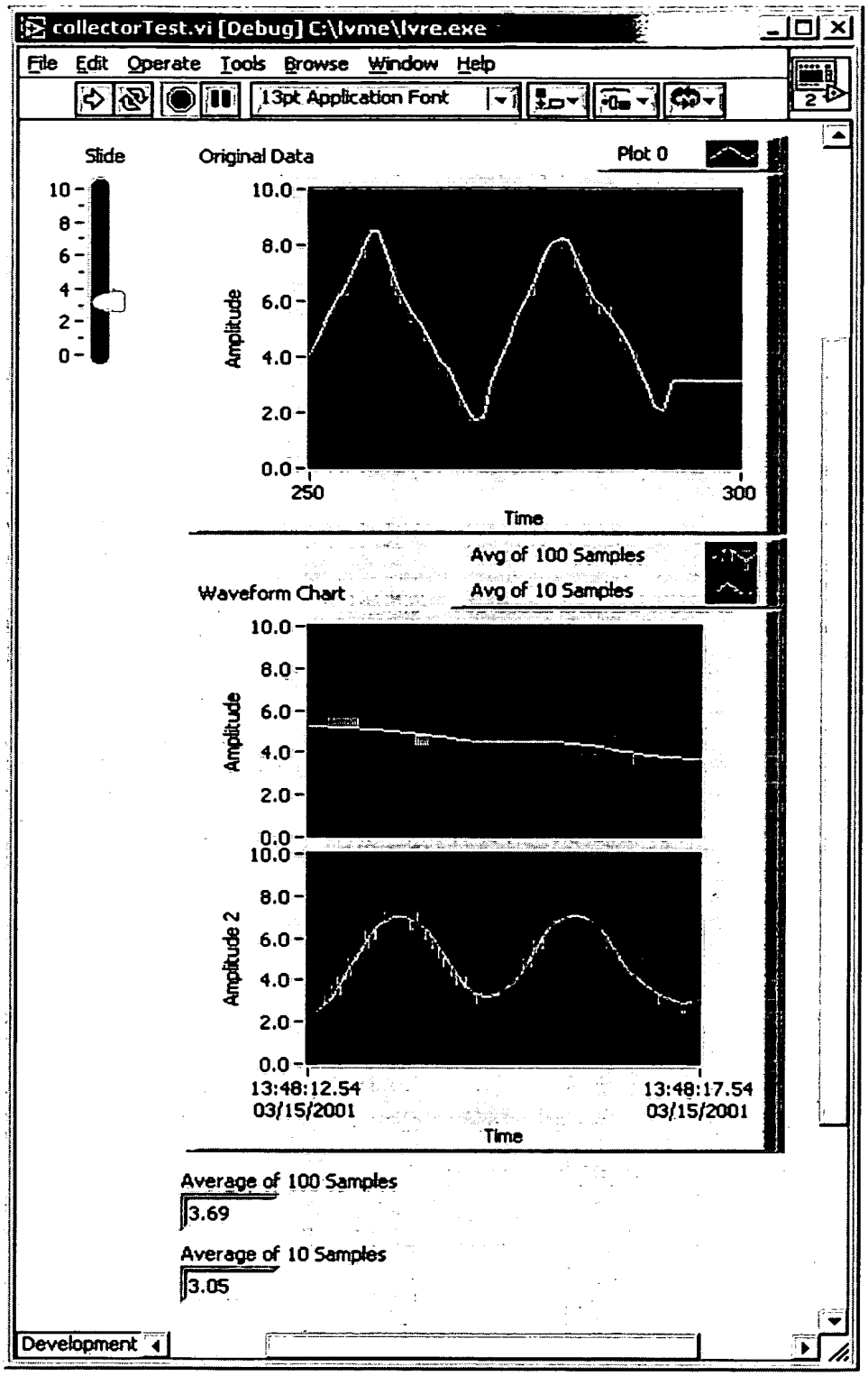

FIG. 33

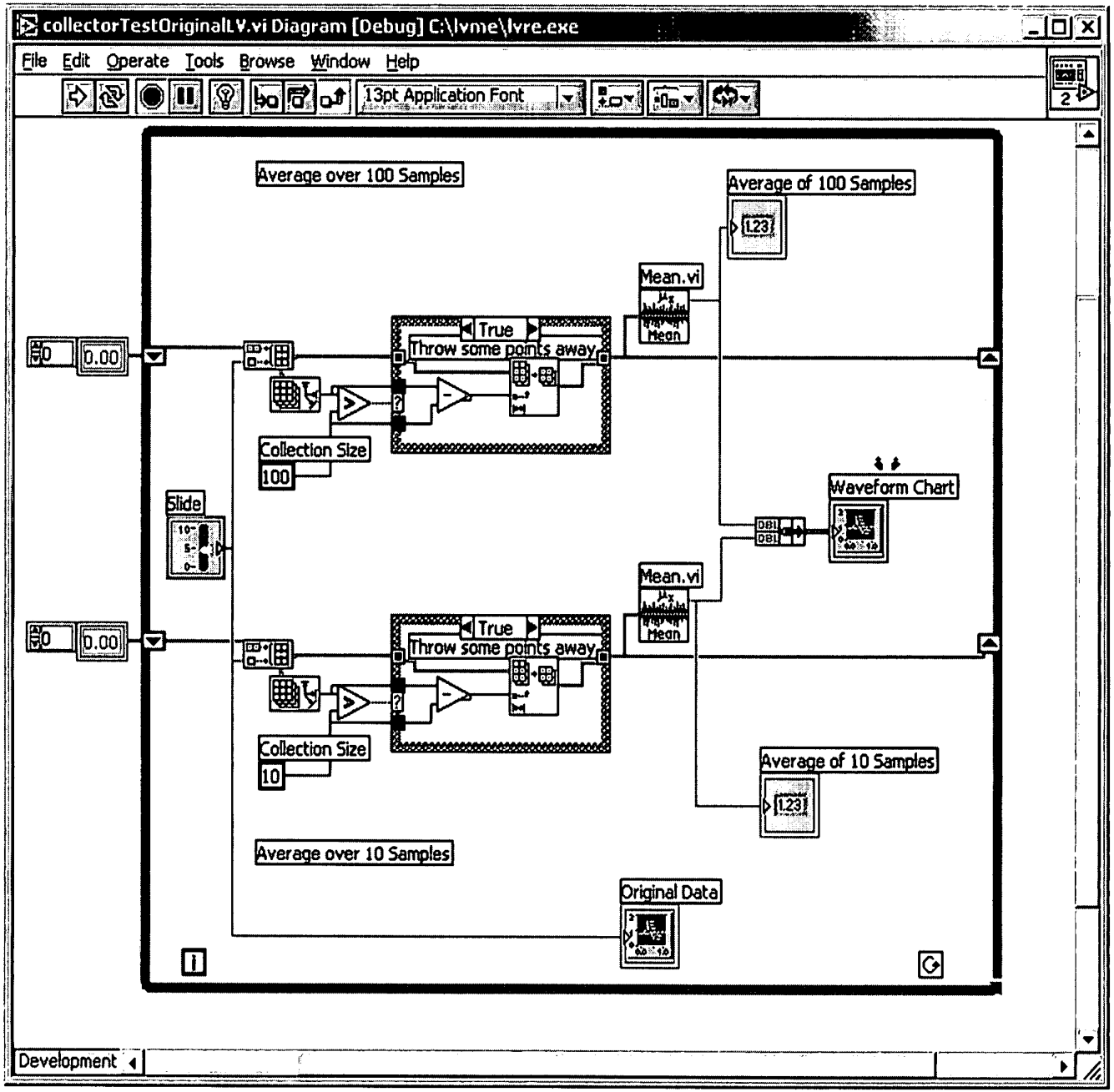

FIG. 34
(PRIOR ART)